

**REMARKS**

Reconsideration of the application in view of the following remarks is respectfully requested.

**Status of the Claims**

Claims 1-19 are pending.

Applicants appreciatively acknowledge the Examiner's indication that claims 13 and 14 contain allowable subject matter and would be allowed if rewritten in independent form. However, Applicants respectfully submit that in view of the following remarks, all claims are in condition for allowance.

**Claim Rejection Under 35 U.S.C. § 112**

Claims 1, 15 and 16 are rejected under 35 U.S.C. § 112, first paragraph for failing to comply with the written description requirement. Applicants respectfully traverse the rejection.

Claims 1 and 16 recite "collectively increasing a temperature of the first nitride semiconductor epitaxial layer, the second nitride semiconductor epitaxial layer, and third nitride semiconductor epitaxial layer to a third temperature higher than the second temperature." Claim 15 recites "collectively increasing a temperature of the buffer layer, the un-doped GaN layer, the InN layer, and the GaN layer."

Support for "collectively increasing" the semiconductor layers can be found in the Specification. For example, the Specification, page 6, lines 6-9, discloses "[i]n a preferred embodiment, the nitride semiconductor epitaxial layer 110 is GaN that is formed by two steps of growing a low-temperature buffer layer and growing a high-temperature layer on the low-temperature buffer layer." To grow a high-temperature layer on the low-temperature layer requires at least collectively increasing the temperature of these layers. This growth method was described

in U.S. Patent No. 5, 290,393, which is disclosed in the Specification at page 1, lines 19-23. Further, the Specification discloses growing a third layer after two previous layers were grown:

Thus, after the nitride semiconductor epitaxial layer 110 consisting of Al<sub>x</sub>Ga<sub>1-x</sub>N (0.1< x < 1) is grown at a growth temperature, the growth temperature is lowered, then the nitride semiconductor epitaxial layer 120, preferably an InN layer is grown.

Specification, page 6, lines 17-20. As to the growth of a third nitride semiconductor epitaxial layer 130, the Specification, at pages 6, line 22 bridging through page 7, line 1, discloses that “a nitride semiconductor epitaxial layer 130 is grown on the nitride semiconductor epitaxial layer 120.” Accordingly, the Specification provides support for the features of pending claims 1, 15 and 16.

Additionally, a person of ordinary skill in the art would understand that to grow a second layer on a first layer, and then a third layer on the second layer would require “collectively increasing” the temperature of the semiconductor layers as they are all in a growth chamber or reactor together.

Reconsideration and withdrawal of the rejection of claims 1, 15 and 16 under 35 U.S.C. § 112, first paragraph is respectfully requested.

Further, because for purposes of the present Office Action the recited feature was not given its proper interpretation, (*see* Office Action, item 2, page 2), Applicants respectfully submit that the claims are entitled to be examined on their merits. Applicants respectfully request that a new office action be issued.

#### **Claim Rejection Under 35 U.S.C. § 103**

Claims 1-6, 8-12 and 16-19 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No 6,455,340 to Chua et al. (“Chua”) in view of U.S. Patent No. 6,740,604 to Kelly et al. (“Kelly”). Because claim 1 now includes a step of raising the collective

temperature of each epitaxial layer, Applicant submits that the claimed invention is patentably distinct over the cited references. Applicants traverse the rejection

Amended independent claim 1 recites a method for growing a nitride semiconductor epitaxial layer which includes the step of releasing nitrogen “from the second nitride semiconductor epitaxial layer by collectively increasing a temperature of the first nitride semiconductor epitaxial layer, the second nitride semiconductor epitaxial layer, and third nitride semiconductor epitaxial layer to a third temperature higher than the second temperature.” Amended claim 16 has been similarly amended.

Chua describes a method for fabricating nitride based semiconductor structures. The Examiner concedes that Chua neither discloses, nor suggests, the release of nitrogen at a temperature greater than the deposition temperature of said GaN. The Examiner attempts to cure this deficiency of Chua with Kelly. Kelly describes a method for separating a semiconductor layer from a substrate. Kelly describes initiating the formation of nitrogen gas by heating a layer through the use of light pulses. The wavelength of the light pulses is chosen based on the band gap energy of the target layer so that the light is **optimized for absorption by the target layer, and is transparent to the surrounding layers.**

Kelly discloses that for thermally activated decomposition:

it is important for it to be possible for the resultant heat to be concentrated onto the interface or the sacrificial layer, on the one hand in order to minimize the required incident intensity, and on the other hand in order to preclude the opossibility of undesired effects on the surrounding material.

Kelly, col. 8, lines 43-48 (emphasis added). Thus, the temperature of the target layer is raised, but the temperature of the surrounding layers is not raised uniformly with the target layer. Clearly, the combination of Chua and Kelly teaches away from collectively increasing the temperatures of multiple adjacent layers, as recited in amended claim 1. The method of amended claim 1 results in the release of nitrogen by raising the temperature of all three layers

simultaneously, and not selectively raising the temperature of an individual layer. Accordingly, for at least the reasons discussed above, Applicants submits that amended claim 1 is patentable over the combination of Chau and Kelly.

Claims 2-6 and 8-12 depend from claim 1 and recite features in addition to the features of their base claim. Claims 17-19 depend from claim 16 and recite features in addition to the features of their base claim. Accordingly, for at least the reasons discussed above, Applicant respectfully submits that claims 2-6, 8-12 and 17-19 are patentable over the combination of Chau and Kelly.

Applicant respectfully requests reconsideration and withdrawal of the rejection

Claim 7 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Chua in view of Kelly and further in view of U.S. Patent No. 6,447,604 to Flynn et al. (“Flynn”).

Applicant submits that Flynn does not cure the deficiencies of Chua and Kelly discussed above. Further, claim 7 depends from claim 1 and recites features in addition to its base claim. Accordingly, for at least the reasons discussed above, Applicant respectfully submits that claim 7 is patentable over the combination of Chau, Kelly and Flynn.

Applicant respectfully requests reconsideration and withdrawal of the rejection

Claim 15 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Chua in view of U.S. Patent No. 6,071,795 to Cheung et al. (“Cheung”).

The Examiner contends that the combination of Chua and Cheung disclose, or suggest, all the features of Claim 15. Because amended claim 15 now recites the step of “collectively increasing a temperature of the buffer layer, the un-doped GaN layer, the InN layer, and the GaN layer,” Applicant respectfully disagrees.

The combination of Chua and Chung does not disclose this collective increase of temperature of the multiple epithelial layers. Accordingly, Chua and Chung neither discloses, nor suggests, the method of amended claim 15. Reconsideration and withdrawal of the rejection is requested.

**CONCLUSION**

Each and every point raised in the Office Action mailed July 8, 2008, has been addressed on the basis of the above amendments and/or remarks. In view of the foregoing it is believed that claims 1-19 are in condition for allowance and it is respectfully requested that the application be reconsidered and that all pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

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Respectfully submitted,

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